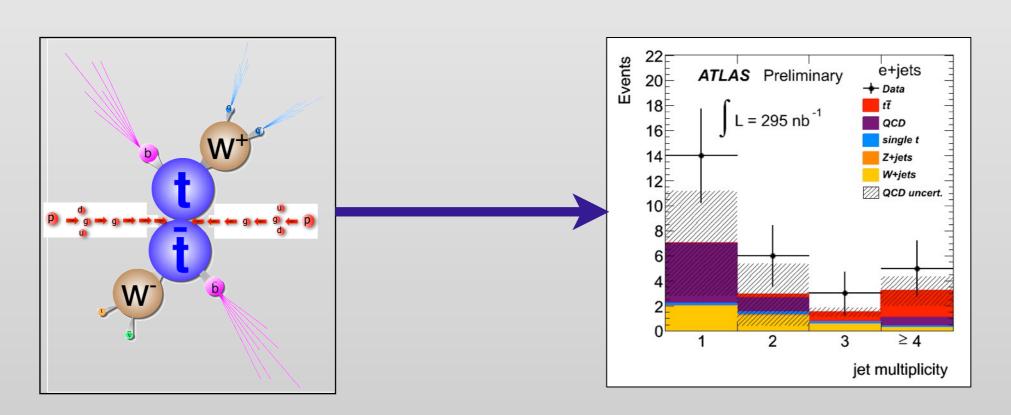




# New Monte Carlo Event Generator Review

J.-F. Arguin (LBNL) November 19-20, 2010





## Motivation



- Monte Carlo Event Generator: programs that randomly generate events (observables) at the theoretical-level, i.e. before detector simulation
  - -Examples: PYTHIA, HERWIG, ALPGEN, MC@NLO, MCFM, etc
- Used ubiquitously in particle physics
  - Detector design, detector commissioning, background estimation, signal modeling, etc, etc
- Large field of research
- If RPP aims to provide a wide coverage of HEP, this review is an obvious addition



## The Team



#### Authors:

- -Paolo Nason (INFN):
  - One of the main POWHEG authors
- -Peter Skands (CERN):
  - One of the main PYTHIA authors

#### Overseer:

- -Christian Bauer (LBNL)
  - Leading author of GENEVA (future NLO event generator for the Large Hadron Collider)



## General Outline



#### I. Introduction

Plan to build upon the existing QCD review

## 2. Perturbative aspects of event generation

- Parton shower
- Fixed-order monte carlo (leading and next-to-leading order)
- Note: emphasize that both are correct extension of QCD

#### 3. Phenomenological models

Hadronization, underlying event, decays, etc

#### 4. Tools

Link existing programs with previously introduced concepts